

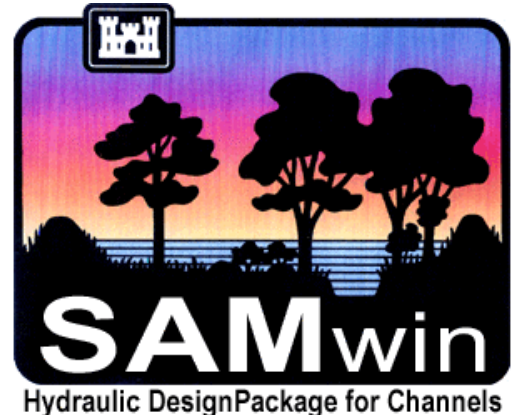


**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

# **SAM Hydraulic Design Package for Channels**

## **Technology**

SAM, a hydraulic design package with an integrated system of programs, provides hydraulic, sediment transport, and sediment yield calculations for the design of stable channels. Using SAM, civil engineers, geologists, scientists and others can rapidly calculate channel size in both fixed and mobile streams. SAM meets engineers' need for a qualitative, easy-to-use methodology for making analyses associated with the design, operation, and maintenance of flood-control channels and stream restoration projects. It is especially helpful in preliminary screening of alternatives where funds for more extensive investigations are not available.



The SAM package was developed through the Flood Damage Reduction Research Program and is designed to run on PC computers. The software is currently available in Windows, and is sometimes called SAMwin. Three main modules of the program can be used separately for various hydraulic design situations

## **Problem**

Before the existence of SAM, more time was spent on computations for hydraulic design calculations, and there was a lack of consistency and difficulty in switching from hydraulic calculations to bed material sediment transport rating curves and to sediment yield. Another problem involved the difficulty in applying a variety of sediment transport functions, as there are now 20 such functions in SAM. In the past, the design of stable channels focused on the erosion process, which is only one of five fundamental processes in sedimentation. SAM provides the computational capability to include all five processes, which include erosion, entrainment, transportation, deposition, and compaction.

## **Expected Cost To Implement**

SAM software and support is free of charge to U.S. Army Corps of Engineers Districts, Divisions, Laboratories, and Centers that participate in the Numerical Model Maintenance Program. Ayres Associates, Fort Collins, CO, developed a Windows interface for the SAM package through a Cooperative Research and Development Agreement (CRDA) with the U.S. Army Engineer Research and Development Center (ERDC). As part of the agreement, Ayers will market the SAM package to all users outside the Corps.

## **Benefits/Savings**

SAM can be used to rapidly assess a project to determine whether there is channel instability, and then to determine the magnitude of that instability. It provides an inexpensive way to make a reliable determination of the extent of investigation a project will require. SAM can also be used to evaluate the relative effects on channel stability, in terms of reducing aggradation and/or degradation, of various project proposals. Because of its ease of use and low input data requirements, SAM can save project resources.

**Status** Under agreement with ERDC, Ayres Associates developed a Windows interface for the SAM package, which was released in 2002 and replaced the older DOS version. As part of the agreement, Ayers will market the SAMwin package to all users outside the Corps.

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**Distribution Sources** USACE users can contact Dinah McComas, Phone: 601-634-2157, e-mail, [Dinah.N.McComas@erdc.usace.army.mil](mailto:Dinah.N.McComas@erdc.usace.army.mil) or SAM ERDC-CHL-MS or [SAM@erdc.usace.army.mil](mailto:SAM@erdc.usace.army.mil). Non-Corps users should contact Linda Brock at Ayers Associates, e-mail, [brock@AyersAssociates.com](mailto:brock@AyersAssociates.com), Phone: 970-223-5556

**Available Documentation** SAM User's Manual contains information related to the theoretical development of the program as well as user's instructions and example problems. The User's Manual comes with the package in PDF format and is installed on the user's computer along with the computation modules. It is available on the Internet at <http://chl.wes.army.mil/software/sam/docs.htm>

**Available Training** Hands-on training is provided for USACE users as part of the PROSPECT course, "Flood Control Channel Design." More information is available at the USACE Professional Development Support Center's Web site at <http://pdsc.usace.army.mil/> or contact David L. Derrick, ERDC, Coastal and Hydraulics Laboratory, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199, e-mail [David.L.Derrick@erdc.usace.army.mil](mailto:David.L.Derrick@erdc.usace.army.mil) Workshops on the application and use of the SAM package can be scheduled on an as-requested basis and can be tailored to the requesting group's needs.

**Available Support** USACE users can contact Dinah McComas, 3909 Halls Ferry Road, Vicksburg, MS 39180-6199; e-mail: [Dinah.N.McComas@erdc.usace.army.mil](mailto:Dinah.N.McComas@erdc.usace.army.mil) SAM ERDC-CHL-MS or [SAM@erdc.usace.army.mil](mailto:SAM@erdc.usace.army.mil) Phone: 601-634-2157. More information on SAM can be found at <http://chl.wes.army.mil/software/sam/> Non-Corps users should contact Lyle Zevenbergen, e-mail [lylez@AyersAssociates.com](mailto:lylez@AyersAssociates.com) for installation and software questions.